

WHAT IS CLAIMED IS:

1. A medical treatment instrument used for coagulating and cutting the patient's body tissue, the medical treatment instrument comprising:

5 a treatment portion arranged at the tip of the treatment instrument, the treatment portion being supported capable of being opened and closed and comprising a pair of grasp portions for grasping the patient's body tissue;

10 a frontal operating portion arranged at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be opened and closed;

15 a heat generating portion provided at least at one of the grasp portions, the heat generating portion being current-carried to coagulate the patient's body tissue grasped between the grasp portions; and

a cutting portion disposed at the grasp portions to cut the patient's body tissue.

20 2. The treatment instrument according to claim 1, wherein the cutting portion is disposed at the rear side of the heat generating portion in the each grasp portion, and constitutes a pair of metal scissors for cutting the patient's body tissue.

25 3. The treatment instrument according to claim 1, wherein the grasp portions have a contact portion coming into contact with the patient's body tissue,

the contact portion being formed of a material with high thermal conductivity;

the heat generating portion is a heating element arranged inside the grasp portion, the heating element being fixed to the contact portion; and

a slip-off preventing portion for preventing slip-off of the patient's body tissue is formed at the contact portion.

4. The treatment instrument according to claim 3, wherein the slip-off preventing treatment portion is formed by ridges on the surface of the contact portion.

5. The treatment instrument according to claim 3, wherein the contact portion is formed by the heat generating portion.

6. The treatment instrument according to claim 3, wherein the contact portion has a cover portion for preventing adhesion of the patient's body tissue on its surface.

7. The treatment instrument according to claim 1, wherein the treatment instrument is formed by surgical operation instrument used for endoscopy operation; the surgical operation instrument has an insert portion to be inserted into the patient's body; the treatment portion is disposed at the distal end of the insert portion; and the operating portion is disposed at the proximal end of the insert portion.

8. The treatment instrument according to claim 1,

wherein the grasp portions have a curve portion curved in a substantial arc shape.

9. The treatment instrument according to claim 1, wherein the heat generating portion is connected to temperature control means for controlling a heating temperature.

10. The treatment instrument according to claim 1, wherein the treatment portion has the heat generating portion provided at one of the pair of grasp portions.

11. The treatment instrument according to claim 1, wherein the treatment portion has the heat generating portions at both of the pair of grasp portions.

12. The treatment instrument according to claim 1, wherein the cutting portion is disposed at the each grasp portion, and is comprised of a dissection treatment heat generating portion for heating and cutting the patient's body tissue.

13. The treatment instrument according to claim 12, wherein the grasp portions have a coagulation treatment heat generating portion with its large area for contact with the patient's body tissue and a dissection treatment heat generating portion with small area for contact with the patient's body tissue.

14. The treatment instrument according to claim 13, wherein the coagulation treatment heat generating portion and the dissection treatment heat generating portion are connected to a power supply

unit comprising an output circuit for supplying power independently.

15. The treatment instrument according to claim 12, wherein the cutting portion comprises  
5 dissection treatment heat generating portion moving means for moving the dissection treatment heat generating portion in a direction identical to the opening/closing direction of the grasp portions; and the frontal operating portion has operating means for  
10 operating the dissection treatment heat generating portion moving means.

16. The treatment instrument according to claim 1, wherein the cutting portion is slidably supported along the grasp portions, and the treatment instrument has  
15 operating means for sliding the cutting portion to the vicinity of a coagulated portion by the heat generating portion.

17. The treatment instrument according to claim 16, wherein the cutting portion is a shear blade.

20 18. The treatment instrument according to claim 17, wherein the shear blade is a scissors-shaped shear blade consisting of upper and lower sections in set.

19. The treatment instrument according to claim 16, wherein the cutting portion is formed by  
25 a heating element wire for dissection.

20. The treatment instrument according to claim 1,

wherein the treatment portion has an interfacing surface at the each grasp portion; the interfacing surface has the heat generating portion and the cutting portion disposed thereon; and the cutting portion is  
5 slidably supported along the grasp portions.

21. A medical treatment instrument used for coagulating and cutting the patient's body tissue, the medical treatment instrument comprising:

a treatment portion disposed at the distal end  
10 of the treatment instrument, the treatment portion being supported capable of being opened and closed, comprising a pair of grasp portions for grasping the patient's body tissue;

a frontal operating portion disposed at the  
15 proximal end of the treatment instrument, the operating portion operating the pair of grasp portion to be opened and closed;

a heat generating portion provided at least one of the grasp portions, the heat generating portion being  
20 current-carried to coagulate a patient's body tissue grasped between the grasp portions; and

a cutting portion disposed at the each grasp portion to cut the patient's body tissue,

wherein the cutting portion is protruded on one  
25 side of the grasp portions in the treatment portion toward the other side of the grasp portions, and comprises a heat treatment protrusion portion for

thermally treating the patient's body tissue and a receiving portion formed at the other side of the grasp portions and receiving the protrusion portion.

22. A medical treatment instrument used for  
5 coagulating and cutting the patient's body tissue, the medical treatment instrument comprising:

a treatment portion disposed at the distal end of the treatment instrument, the treatment portion being supported capable of being opened and closed and  
10 comprising a pair of grasp portions for grasping the patient's body tissue;

a frontal operating portion arranged at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be  
15 opened and closed; and

a heat generating portion provided at least at one of the grasp portions, the heat generating portion being current-carried to coagulate the patient's body tissue grasped between the grasp portions,

20 wherein the grasp portions each have an insert portion for inserting cutting means for cutting the patient's body tissue.

23. A medical treatment instrument used for coagulating and cutting the patient's body tissue,  
25 the medical treatment instrument comprising:

a treatment portion arranged at the distal end of the treatment instrument, the treatment portion being

supported capable of being opened and closed and comprising a pair of grasp portions for grasping the patient's body tissue;

5 a frontal operating portion disposed at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be opened and closed; and

10 a heat generating portion provided at least at one of the grasp portions, the heat generating portion being current-carried to coagulate the patient's body tissue grasped between the grasp portions,

wherein the heat generating portion is heater means consisting of an insulation material.

24. The treatment instrument according to  
15 claim 23, wherein the heater means is a ceramic heater having a heat transmitting portion made of ceramic and a heating element provided in this heat transmitting portion.

25. The treatment instrument according to  
20 claim 23, wherein the heater means is reinforced by a reinforce member consisting of a metal.

26. The treatment instrument according to  
claim 23, wherein the heater means has a cover portion for preventing adhesion of the patient's body tissue  
25 provided on its surface.

27. The treatment instrument according to  
claim 24, wherein the each grasp portion is formed by

jaws consisting of stainless steel; the jaws have an intermediate connection member provided between the ceramic heaters and jaws; and the intermediate connection member has first connecting means to be  
5 connected to the ceramic heater and second connecting means to be connected to the jaws.

28. A power supply unit connected to a medical treatment instrument used for coagulating and cutting the patient's body tissue,

10 wherein the treatment instrument comprises a treatment portion arranged at the distal end thereof, the treatment portion being supported capable of being opened and closed and comprising a pair of grasp portions for grasping the patient's body tissue;  
15 a frontal operating portion arranged at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be opened and closed; and a heat generating heater portion provided at least at one of the grasp portions, the heater  
20 portion being current-carried to coagulate and cut the patient's body tissue grasped between the grasp portions, the power supply unit comprising:

resistance value measuring means for measuring a resistance value of the heater portion; and

25 control means for controlling power supply to the heater portion according to an initial resistance value of the heater portion.



29. The power supply unit according to claim 28,  
wherein the power supply unit has a measurement switch  
for measuring the initial resistance value; and means  
for, when the measurement switch is pressed, setting  
5 the resistance value of the heater portion measured by  
the resistance value measuring means as an initial  
resistance value.

30. The power supply unit according to claim 28,  
wherein the power supply unit has means for  
10 automatically measuring the initial resistance value  
when a treatment instrument incorporating the heater  
portion is connected.

31. The power supply unit according to claim 28,  
wherein the power supply unit comprises resistance  
15 value measuring means for measuring a resistance value  
of the heater portion; temperature measuring means for  
measuring a temperature of the heater portion from the  
resistance value of the heater portion; and means for  
correcting the temperature by using the initial  
20 resistance value of the heater portion.

32. The power supply unit according to claim 28,  
wherein the power supply unit comprises control means  
for, if the initial resistance value of the heater  
portion is not measured, controlling operation so as  
25 not to output.

33. A coagulating treatment instrument used for  
coagulating the patient's body tissue, the coagulating

treatment instrument comprising:

a treatment portion arranged at the distal end of the treatment instrument, the treatment portion being supported capable of being opened and closed and comprising a pair of grasp portions for grasping the patient's body tissue;

a frontal operating portion arranged at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be opened and closed;

a heater portion provided at least at one of the grasp portions, the heater portion being current-carried and heated to coagulate the patient's body tissue grasped between the grasp portions; and

an adhesion preventing treatment portion for covering the periphery of the heater portion, thereby to prevent adhesion of the patient's body tissue, the adhesion preventing treatment portion being detachably mounted to the grasp portions.

34. The treatment instrument according to claim 33, wherein the adhesion preventing treatment portion is provided on the outer surface of a cover detachable from the heater portion.

35. The treatment instrument according to claim 33, wherein the heater portion is detachably mounted on the grasp portions; and the adhesion preventing treatment portion is provided on the outer

surface of the heater portion.

36. The treatment instrument according to claim 35, wherein the treatment instrument has a heater unit detachably connected thereto, the heater portion is contained in the heater unit, and the heater unit has a electrically conducting member for supplying power to the heater portion.

37. The treatment instrument according to claim 33, wherein the adhesion preventing treatment portion is a cover detachable from the heater portion.

38. A coagulating treatment instrument used for coagulating the patient's body tissue, the coagulating treatment instrument comprising:

a treatment portion arranged at the distal end of the treatment instrument, the treatment portion being supported capable of being opened and closed and comprising a pair of grasp portions for grasping the patient's body tissue;

a frontal operating portion arranged at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be opened and closed; and

a heater portion provided at least at one of the grasp portions, the heater portion being current-carried to coagulate the patient's body tissue grasped between the grasp portions,

wherein the treatment instrument has a coagulation

surface for coagulating the patient's body tissue provided at least at the heater portion or either one of the grasp portions; and the coagulation surface comprises a distal end abutting against the counterpart member of the grasp portions each other immediately after closing of the grasp portions; and a proximal end having a gap provided between the proximal end and the counterpart member of the grasp portion.

39. The treatment instrument according to claim 38, wherein the grasp portions can be elastically deformed by a closing force applied to the operating portion, and the heater portion consists of a rigid element.

40. The treatment instrument according to claim 38, wherein the operating portion comprises a stopper member actuated to stop closing operation of the grasp portions at a predetermined closed position during close movement of the grasp portions.

41. The treatment instrument according to claim 40, wherein the closed position is determined at a position where the grasp portions are elastically deformed, and the proximal end of the coagulation surface substantially abuts.

42. A coagulating treatment instrument used for coagulating the patient's body tissue, the coagulating treatment instrument comprising:

a treatment portion arranged at the distal end of

the treatment instrument, the treatment portion being supported capable of being opened and closed and comprising a pair of grasp portions for grasping the patient's body tissue;

5           a frontal operating portion arranged at the proximal end of the treatment instrument, the operating portion operating the pair of grasp portions to be opened and closed;

10           a heater portion provided at least one of the grasp portions, the heater portion being current-carried;

          bipolar electrically conducting members connected to the heater portion, these bipolar electrically conducting members being insulated from each other  
15           and arranged at a main body of the treatment instrument; and

          exposure preventing means for preventing the electrically conducting member from being exposed to the outside of the main body of the treatment  
20           instrument.

43. The treatment instrument according to claim 42, wherein the electrically conducting member is a lead wire.

44. The treatment instrument according to  
25           claim 42, wherein the treatment instrument main body comprises a housing groove of the electrically conducting member, and the exposure preventing means

houses the electrically conducting member in the housing groove.

45. The treatment instrument according to claim 42, wherein the treatment instrument main body comprises a housing groove of the electrically conducting member, and the exposure preventing means is a cover member for covering the housing groove while the electrically conducting member is housed in the housing groove.

46. The treatment instrument according to claim 42, wherein the treatment instrument main body is comprised of a metal, and the electrically conducting member is composed of the treatment instrument main body at least at one electrode.

47. The treatment instrument according to claim 46, wherein at least a part of the treatment instrument main body is covered for insulation.

48. In a coagulating/cutting system comprising a medical instrument used to coagulate and incise a living tissue and a control element for controlling the operation of the instrument,

the instrument including

a first engaging portion having a first engaging surface constituting an engaging surface for holding the living tissue,

a second engaging portion having a second engaging surface constituting an engaging surface capable of

holding the living tissue in conjunction with the first engaging surface,

5 a holding drive element capable of moving the first and second engaging portions toward and away from each other to hold the living tissue, and

a heating unit adapted to heat the first engaging portion when energized,

the control element including

10 a current supply element for supplying current to the heating unit, and

a setting element capable of adjusting the current supply element to a temperature at which the living tissue can be incised as the heating unit is heated when the living tissue is held between the first and second engaging surfaces by means of the holding drive element.

15 49. In a coagulating/cutting system comprising a medical instrument used to coagulate and incise a living tissue and a control element for controlling the operation of the instrument,

the instrument including

a first engaging portion having a first engaging surface constituting an engaging surface for holding the living tissue,

25 a second engaging portion having a second engaging surface constituting an engaging surface capable of holding the living tissue in conjunction with the first

engaging surface,

a holding drive element capable of moving the first and second engaging portions toward and away from each other to hold the living tissue, and

5 a heating unit adapted to heat the first engaging portion when energized,

the control element including

a current supply element for supplying current to the heating unit,

10 a first setting element capable of adjusting the current supply element to a temperature at which the living tissue can be coagulated as the heating unit is heated when the living tissue is held between the first and second engaging surfaces by means of  
15 the holding drive element, and

a second setting element capable of adjusting the current supply element to a temperature at which the living tissue can be incised as the heating unit is heated when the living tissue is held between the first  
20 and second engaging surfaces by means of the holding drive element.

50. A coagulating/cutting system according to claim 49, wherein said control element further includes a set state changing element capable of changing at  
25 least one of set states of the current supply element set by means of the first and second setting portions.

51. A coagulating/cutting system according to



claim 49, wherein said control element includes a first switch for driving the current supply element set by means of the first setting element and a second switch for driving the current supply element set by means of the second setting element.

52. A coagulating/cutting instrument used to coagulate and incise a living tissue, comprising:

a first engaging portion having a first engaging surface constituting a protrusion holding the living tissue;

a second engaging portion having a second engaging surface constituting an engaging surface capable of holding the living tissue in conjunction with the first engaging surface;

a holding drive element capable of moving the first and second engaging portions to hold the living tissue, and

a heating unit adapted to heat the first engaging portion when energized.

53. A coagulating/cutting instrument according to claim 52, wherein said first engaging surface is an elongate flat surface.

54. A coagulating/cutting instrument according to claim 52, wherein said first engaging surface is an elongate curved surface profiled in the shape of a substantially circular arc.

55. A coagulating/cutting instrument according to

claim 52, wherein said second engaging portion includes a receiving member formed of a resin.

56. A coagulating/cutting instrument according to claim 55, wherein said resin is a flexible material.

5 57. A coagulating/cutting instrument according to claim 55, wherein the material of said receiving member is rubber.

58. A coagulating/cutting instrument according to claim 55, wherein the material of said receiving member is gel.  
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59. A coagulating/cutting instrument according to claim 55, wherein the material of said receiving member is fluoroplastic.

60. A coagulating/cutting instrument according to claim 55, wherein said receiving member has a groove on a portion thereof in contact with the first engaging surface.  
15

61. A surgical instrument, comprising:

a distal end portion including a pair of holding portions for holding a living tissue, said holding portion having a contact surface that is brought into contact with said living tissue; and  
20

a manual operating portion for opening or closing said holding portions;

25 wherein at least one of said holding portions has a heat generating portion formed in said contact portion with the living tissue, and

the contact surface of the heat generating portion with the living tissue is smaller in the contact area with the living tissue than the contact surface of the other holding portion with the living tissue.

5           62. The surgical instrument according to claim 61, wherein the contact surface of said heat generating portion with the living tissue is formed arcuate in its cross section.

10           63. The surgical instrument according to claim 61, wherein the contact surface of the other holding portion, which is arranged to face said heat generating portion, with the living tissue is formed of a heat insulating material.

15           64. The surgical instrument according to claim 61, wherein said holding portion is curved from the distal end toward the proximal end.

20           65. The surgical instrument according to claim 61, wherein a slip preventing portion is formed in the contact surface of the other holding portion, which is arranged to face said heat generating portion, with the living tissue.

25           66. The surgical instrument according to claim 61, wherein a coating for preventing the sticking of the heated living tissue is applied to the outer surface of said holding portion.

          67. The surgical instrument according to claim 61, wherein the contact surface of the other holding

portion, which is arranged to face said heat generating portion, with the living tissue is formed of a second s heat generating portion that is rectangular in its cross section.

5           68. The surgical instrument according to claim 61, wherein the other holding portion, which is arranged to face said heat generating portion, has a chamfered portion in which the both edge portions of the contact surface with the living tissue are cut to have an  
10 obtuse angle.

          69. The surgical instrument according to claim 61, wherein the contact surface of other holding portion, which is arranged to face said heat generating portion, with the living tissue is formed of a flexible heat  
15 insulating material.